WHAT IS CLAIMED IS:

1. A method for controlling a laser power used in recording on an optical disk comprising:

causing the laser to emit a test light emission pattern including a multipulse light emission interval in which a pulse current intensity-modulated between a peak value current and a bottom value current in formation of a recording mark onto the optical disk is supplied to thereby cause the laser to emit light pulses; and an at-bottom value continuous light emission interval in which the bottom value current is continuously supplied for a predetermined time to thereby cause the laser to emit light continuously;

receiving the test light emission pattern of the laser to convert the pattern to an electric signal and to thereby obtain a light detection signal;

calculating a detection value of a multipulse average value from the average value of the light detection signal in the multipulse light emission interval, and calculating a bottom detection value from the light detection signal in the at-bottom value continuous light emission interval to obtain a light emission power characteristic of the laser on the supplied current based on the detection value of the multipulse average value and the bottom detection value; and

controlling the current supplied to the laser based on the light emission power characteristic on the current supplied to the laser.

2. The method for controlling a laser power according to claim 1, wherein in the step of causing the laser to emit the test light emission pattern, the test light emission pattern used further includes an at-bias value continuous light emission interval in which a bias value current in formation of a recording space is supplied continuously for a predetermined time to thereby cause the laser to emit

light continuously and,

in the step of obtaining the light emission power characteristic of the laser, a bias detection value is further calculated based on the light detection signal in the at-bias value continuous light emission interval to thereby obtain the light emission power characteristic of the laser on the supplied current based on the bias detection value, the detection value of a multipulse average value and the bottom detection value.

3. The method for controlling a laser power according to claim 1, wherein in the step of causing the laser to emit the test light emission pattern, the test light emission pattern used further includes a spontaneous light emission interval in which a current less than a threshold current at which the laser emits light is supplied to the laser to cause spontaneous light emission and,

in the step of obtaining the light emission power characteristic of the laser, an offset is detected based on a detection value of the light detection signal in the spontaneous light emission interval.

4. The method for controlling a laser power according to claim 1, wherein in the step of causing the laser to emit the test light emission pattern, the test light emission pattern used further includes a light-off interval in which a supplied current is set substantially to zero to turn the laser off and

in the step of obtaining the light emission power characteristic of the laser, an offset is detected based on a detection value of the light detection signal in the light-off interval.

5. The method for controlling a laser power according to claim 1, wherein a time width Tmp of the multipulse light emission interval satisfies the following relation with respect to a time width Tmax of the longest recording mark of data

in a recording region of the optical disk:

$Tmax < Tmp$.

6. The method for controlling a laser power according to claim 5, wherein the time width Tmp of the multipulse light emission interval satisfies the following relation with respect to a wobble cycle T_{wbl} on a recording track of the optical disk:

$Tmp < T_{wbl}/2$.

7. The method for controlling a laser power according to claim 1, wherein the time width Tb of the at-bottom value continuous light emission interval satisfies the following relation with respect to a time width Tmax of the longest recording mark of data in a recording region of the optical disk:

$Tmax < Tb$.

8. The method for controlling a laser power according to claim 7, wherein a time width Tb of the at-bottom value continuous light emission interval satisfies the following relation with respect to a wobble cycle T_{wbl} on a recording track of the optical disk:

$Tb < T_{wbl}$.

9. The method for controlling a laser power according to claim 1, wherein a time width Tmp of the multipulse light emission interval and a time width Tb of the at-bottom value continuous light emission interval satisfy the following relation with respect to a time width $T_{apcarea}$ during which scanning is performed over a laser power control region provided on the optical disk for controlling a power of the laser:

$Tmp + Tb < T_{apcarea}$.

10. The method for controlling a laser power according to claim 2, wherein a

time width Te of the at-bias value continuous light emission interval satisfies the following relation with respect to a time width Tmax of the longest recording mark of data in a recording region of the optical disk:

Tmax < Te.

11. The method for controlling a laser power according to claim 10, wherein the time width Te of the at-bias value continuous light emission interval satisfies the following relation with respect to a wobble cycle T_{wbl} on a recording track of the optical disk:

$Te < T_{wbl}/2$.

12. The method for controlling a laser power according to claim 3, wherein a time width T0 of the spontaneous light emission interval satisfies the following relation with respect to a time width Tmax of the longest recording mark of data in a recording area of the optical disk:

Tmax < T0.

13. The method for controlling a laser power according to claim 12, wherein the time width T0 of the spontaneous light emission interval satisfies the following relation with respect to a wobble cycle T_{wbl} on a recording track of the optical disk:

$T0 < T_{wbl}$.

14. The method for controlling a laser power according to claim 4, wherein a time width T0 of the light-off interval satisfies the following relation with respect to a time width Tmax of the longest recording mark of data in a recording area of the optical disk:

Tmax < T0.

15. The method for controlling a laser power according to claim 14, wherein

the time width T0 of the light-off interval satisfies the following relation with respect to a wobble cycle T_{wbl} on a recording track of the optical disk:

$T0 < T_{wbl}$.

16. The method for controlling a laser power according to claim 3, wherein in the spontaneous light emission interval, a current I_{led} supplied to the laser satisfies the following relation with respect to a threshold current Ith of the laser:

$Ith /4 \leq I_{led} < Ith$.

17. The method for controlling a laser power according to claim 3, wherein in the spontaneous light emission interval, a current I_{led} supplied to the laser satisfies the following relation with respect to a threshold current Ith of the laser:

$Ith / 4 \leq I_{led} \leq Ith * 3 / 4$.

18. The method for controlling a laser power according to claim 3, wherein in the spontaneous light emission interval, a current I_{led} supplied to the laser satisfies the following relation substantially with respect to a threshold current Ith of the laser:

$I_{led} = Ith / 2$.

19. An apparatus for controlling a laser power used in recording on an optical disk comprising:

a formatter having a test light emission pattern including a multipulse light emission interval in which a pulse current intensity-modulated between a peak value current and a bottom value current in formation of a recording mark onto the optical disk is supplied to the laser to thereby cause the laser to emit light pulses; and an at-bottom value continuous light emission interval in which the bottom value current is continuously supplied to the laser for a predetermined time to thereby cause the laser to emit light continuously;

a laser driving unit supplying a current to the laser based on the test light emission pattern transmitted from the formatter to cause test light emission;

a laser power detecting unit receiving the test light emission pattern of the laser to convert the pattern to an electric signal and to thereby obtain a light detection signal; and

an arithmetic unit which calculates a detection value of a multipulse average value from the average value of the light detection signal in the multipulse light emission interval, and which calculates a bottom detection value from the light detection signal in the at-bottom value continuous light emission interval to obtain a light emission power characteristic of the laser on a supplied current based on the detection value of a multipulse average value and the bottom detection value, and to control a current supplied to the laser based on the light emission power characteristic.

20. An apparatus for controlling a laser power according to claim 19, wherein the test light emission pattern further includes an at-bias value continuous light emission interval in which a bias value current in formation of a recording space is supplied to the laser continuously for a predetermined time to thereby cause the laser to emit light continuously and

in the arithmetic unit, a bias detection value is further calculated based on the light detection signal in the at-bias value continuous light emission interval to thereby obtain the light emission power characteristic of the laser on the supplied current based on the bias detection value, the detection value of a multipulse average value and the bottom detection value.

21. The apparatus for controlling a laser power according to claim 19, wherein the test light emission pattern further includes a spontaneous light emission

interval in which a current less than a threshold current of the laser is supplied to cause spontaneous light emission and

the arithmetic unit detects an offset based on a detection value of the light detection signal in the spontaneous light emission interval.